REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested.

Claim Rejections – 35 USC § 103

The Office Action rejected claims 1, 3-7, 10, 12-14, 28 and 30-31 under 35 USC § 103(a) as being unpatentable over Bridges in view of Laird.

Applicant appreciates the telephone interview conducted with the Examiner on April 5, 2006. During the interview, Applicant's representative argued that Bridges and Laird are not properly combined, and such arguments are presented in this Response. Agreement was not reached regarding allowance of the claims.

Bridges teaches a wellhead assembly that has a metal seal that accommodates misalignment between a casing and the bore of the wellhead housing. The metal seal assembly includes a metal seal ring and a wedge ring. The seal ring has a cylindrical inner wall and a conical outer wall. The centerlines of the inner-and outer walls are offset with respect to each other, making the ring eccentric. Similarly, the wedge ring has a conical inner wall and an conical outer wall. If inner and outer walls are offset with respect to each other, the rings can be rotated relative to each other and to the casing to coincide the axis of the outer wall of the wedge ring with the axis of the wellhead housing bore. The inner wall of the seal ring has protruding bands which deform as a result of the softness of the metal to enhance sealing (Abstract).

In the course of illustrating his invention, Bridges schematically illustrates a flanged connection that includes a metal seal ring 19. As acknowledged by the Office Action, Bridges discloses that the flanges at 17 and 39 are securely connected by bolts. Persons skilled in the art should understand that Bridges teaches a standard flanged connection. Moreover, persons skilled in the art should also understand that Bridges illustrates a standard "BX" metal seal rating that is well known in the art and has been used for many years in flanged wellhead connections. Bridges therefore teaches a metal seal ring in a flange connection similar to that taught by Putch et al. The teachings of Putch et al. have been traversed.

With respect to the BX ring shown in the drawings but not described by Bridges, BX rings are widely used in flange connections secured in a sequential bolt

tightening procedure. Flange makeup, a procedure well known to those skilled in the art, requires that closely spaced bolts for connecting the opposed flanges together be tightened in a predetermined sequence. Not only must the flanges be bolted together, each bolt is tightened in the predetermined sequence to a predetermined torque.

This procedure is explained in material from the web site of WOODCO USA, a well known manufacturer of flanged components for wellheads and metal seal rings for use in flanged connections made with those components, at Attachment A. These materials refer to API Spec 6A, which Applicant understands was published more than one year prior to the priority date of the present application.

The Office Action asserts that Laird teaches that connecting two components by either bolts 24 or nut 30 are equivalent in the art. Applicant respectfully disagrees.

Laird teaches a gasket for pipe fitting. As should be understood by those skilled in the art, pipe fitters deal with relatively low pressures, such as those encountered in steam boilers and the like. There is nothing in Laird that would motivate one skilled in the art to deviate from the established practice of securing metal gasket rings in a flanged connection as in Bridges, in a sequential bolt-tightening procedure as described at Attachment A. At least because there is no motivation in Laird to apply a threaded connection to a seal construction as in Bridges, independent claims 1, 4 and 28 should be allowable over these references.

Moreover, while Laird teaches that (see page 2, lines 80-88) the disclosed gasket may be used where pressure is high, it should be understood that high pressure in a steam system would not equate to high pressure in an oil drilling system as in Bridges. In any event, Laird explains that in "such cases it may be necessary to provide abutment screws 36 which are threaded through one flange and arranged to make engagement with the face of the opposing flange by which movement of one flange relative to the other may be limited or prevented." It appears that the abutment screws 36 could be used in a bolted flange connection shown in Figs. 1 and 2 but not in the threaded union shown in Laird Fig. 4. For this additional reason, Applicant submits that Laird fails to provide motivation to apply a threaded union to a high pressure system as in Bridges.

Nonetheless, to facilitate prosecution of the present application, Applicant has amended claims 1 and 4 to call for a female socket in the first subcomponent that receives a male pin of the second subcomponent. The flanged connections of Bridges and Putch include neither a female socket nor a male pin. Laird includes neither a female socket nor a male pin.

The rejection of claims 1, 3-7, 10 and 12-14 is thereby traversed.

With respect to claim 28, the same amendment has been made. For reasons explained above in detail, Laird neither teaches nor suggests the method claim in amended claim 28.

Bridges teaches nothing that cures the deficiencies of Laird and the rejection of claims 28 and 30-31 is traversed.

The Office Action rejected claims 2, 11 and 29 under 35 USC § 103(a) as being unpatentable over Bridges in view of Laird and further in view of Parmesan. Parmesan teaches a threaded union which uses an elastomeric seal ring retained by retainer ring 7 (7a) and clamped tightly between opposing ends of the coupling members 1 and 2b. Parmesan fails to cure the deficiencies of Bridges and Laird. The rejection of claims 2, 11 and 29 is thereby traversed.

The Office Action rejected claims 8 and 9 under 35 USC § 103(a) as being unpatentable over Bridges in view of Laird. For reasons set forth above with respect to claim 1, the rejection of claims 8 and 9 is traversed.

The Office Action rejected claims 15-19 under 35 USC § 103(a) as being unpatentable over Bridges in view of Laird. With respect to claims 15-19, the arguments set forth above with respect to claim 1 apply and the rejection of those claims is traversed.

Response to Arguments

It is therefore respectfully submitted that, for at least the reasons set forth above in detail, claims 1-19 and 28-31 that remain pending in this application define novel subject matter and are in a condition for immediate allowance. Favorable reconsideration and early issuance of a Notice of Allowance is therefore requested.

Respectfully submitted,

NELSON MULLINS RILEY
& SCARBOROUGH, L.L.P.

Lloyd G. Farr
Registration No. 38,446

1320 Main Street
Columbia, SC 29201
(404) 817-6165
Fax (803) 255-9831

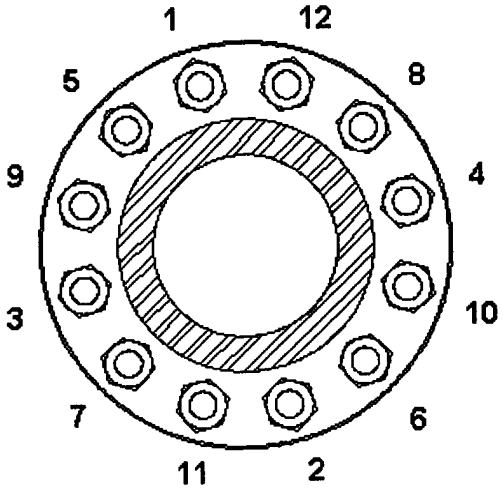
ATTACHMENT A

Flange Make-up, Stand-off / No Stand-off and Drift between Flanges

Prior to assembling a flanged connection, clean the ring grooves and inspect for damage (see Field Appraisal of Ring Grooves). Select a new ring gasket of the specified size (To identify the flange see Flange Slide Rule, For known flanges see Flange Reference Chart). Light lubrication of the ring groove with a multi-purpose grease will not hurt, and may help, if the ring groove has a ***rougher*** [1] than specified surface finish. Take special care to avoid filling the bottom of the ring groove with grease so as not to block the downward travel of the ring gasket into the groove and limit the coining* effect (also limiting the width of intimate contact between the gasket and the groove). Install the gasket and set the flanges together. Place lubricated bolts into bolt holes and install nuts, lubricated on their back face, by hand. Tighten bolts by hand until nuts on both sides touch the backs of their respective flanges and have equal engagement on their stud bolts. At this point observe the stand-off between flanges for equal appearance all around, make any adjustment necessary to equalize the stand-off all around. This may require hand or hammer wrenches to achieve this equal stand-off.

Begin tightening by rotating nuts clockwise 1/2 turn, choosing one bolt first, then choosing the bolt 180° opposite second. then one at 90° and then the one 180° from that. Then step over one nut from the first nut tightened (decide for yourself clockwise or counter-clockwise) and continue the same pattern as with the first four. See illustration below for tightening order of a 12 bolt flange:

SAMPLE MAKE-UP TIGHTENING SEQUENCE



As bolts increase in tightness, decrease the amount of turn on each nut keeping all in equal proportion. Continue to monitor the stand-off and keep it equal all around during the tightening process. Judge make-up by observing the stand-off or if using a torque wrench, by achieving specified torque. Reference torque information when available (see Flange Slide Rule for API specified lubricant and torque on current API Spec 6A flanges). In the event the connection joins a Studded Flange with an Open Face Flange, then everything remains the same except that the studs have only one nut to tighten, eliminating the difficulty of keeping nut engagement equal on both ends of stud bolts.

If any properly made up connection leaks on test, it should be disconnected, inspected and if ***OK*** , reassembled with a new gasket and retested. Any attempt to retighten a leaking connection, without disassembly, traps test fluid under the ring gasket limiting ring gasket coining and reducing the reliability of the connection. For more information see Test Rack Tips on this web site.

> **coining*: The condition of bringing metal surfaces of differing hardness so tightly together that the softer surface deforms to match the harder surface exactly in shape and finish.